

Report to the Public Service Board

**Evaluation Activities Related to
Statewide Energy Efficiency Utility
Second 3-year Contract Cycle (Years 2003 - 2005)**

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I. Introduction

The September 30, 1999 Board order creating an Energy Efficiency Utility (“EEU”) in Docket 5980 established that the Department of Public Service (“Department” or “DPS”) has a specific role as the entity charged with providing formal evaluation of the efficiency utility programs and that these evaluation activities would be funded by energy efficiency charge (“EEC”) funds collected by the Fiscal Agent. The Board approved Memorandum of Understanding further specified that the evaluation would include, but not be limited to, an assessment of market transformation accomplishments.

In its May 29, 2002 “Report and Recommendations to the Vermont Public Service Board Relating to Vermont’s Energy Efficiency Utility”, the Department provided a summary of DPS formal evaluation activities together with draft summary reports and preliminary findings. On August 14, 2003, the Department provided a report on the conclusion of the Department’s EEU evaluation activities for the years 2000 through 2002, the first three years of EEU operation.

This report summarizes the DPS’s EEU Evaluation activities and results for the years 2003 - 2005, the second three years of the statewide EEU operations.

II. DPS 2003 - 2005 EEU Evaluation Activities Plan

On December 1, 2003, the Department provided the Public Service Board with its Energy Efficiency Utility (“EEU”) Evaluation Plan for Years 2003 through 2005. The Plan contained the following objectives:

- Provide the Board with the information it needs to fulfill its statutory obligation regarding evaluation of EVT performance
- Provide information needed to conduct a new competitive solicitation for an entity to serve as the EEU in the next contract cycle, 2006 through 2008
- Provide the information needed to determine how individual programs or groups of programs could be improved
- Verify that claimed energy savings are actually being achieved
- Develop a knowledge base that will help the Board and the Department make decisions on how the overall structure and operations of the EEU could be improved in the next contract cycle

The December 1 document included a list of 10 proposed evaluation projects. Subsequent discussions with the Public Service Board adjusted and refined this list as reflected in a March, 2004 “Revised List of Evaluation Projects for the Contract Period 2003 through 2005”. Both documents are included in this report as appendices 3 & 4.

The projects listed in the March 5, 2004 document are:

- Scoping Study.
- Commercial and Industrial market Impacts & Research Strategic market Assessment
- Residential Market Impacts & Research Strategic Market Assessment
- Annual Savings Verification and Assessment of Minimum Performance Standards and Performance Awards Indicators

In addition to completing this work, the Department utilized its EEU Evaluation budget to retain the services of an energy efficiency evaluation expert consultant over the 3 year period and to cover costs incurred in 2003 to complete evaluation projects conducted primarily in the 2000-2002 contract cycle.

III. Budget and Expenditures

The total EEU annual budget for the three year period 2003-2005 was \$47.8 million.¹ The DPS budget for this three year period totaled \$1.5 million. A summary showing available funds and DPS evaluation expenditures over the three year period are shown in the following table.

Table 1:DPS EEU Evaluation Expenditures for years 2003 through 2005

Funds Available	EEC Fund Allocation	\$ 1,502,322
	BED Contribution	\$ 72,586
	Total	\$ 1,574,908
Expenditures	Residential Evaluation	\$ 513,048
	C&I Evaluation	\$ 410,179
	Verification	\$ 185,033
	Planning/Management	\$ 120,168

¹ This amount includes Efficiency Vermont and Burlington Electric Department EEU budgets; the DPS EEU Evaluation, and the Board's Contract Administrator, Fiscal Agent, and financial auditing costs.

IV. 2003 - 2005 Evaluation Activities and Results

The projects listed in the March, 2004 Plan document were designed primarily to achieve three core objectives, which were consistent with the overall objectives put forth in the DPS 2000 - 2002 EEU Evaluation Plan. The objectives are:

- provide verification of the claimed annual savings and total resource benefit claims by Efficiency Vermont (“EVT”) and Burlington Electric Department (“BED”) for each year of the 3 year period;
- assess the residential energy efficiency markets and establishment of baselines to better document the market and the effects of the EEU programs on those markets; and
- assess the non-residential, commercial and industrial energy efficiency markets to better document market conditions and the effects of the EEU programs on those markets.

To implement this Plan and achieve the identified objectives, the Department issued formal Requests for Proposals (“RFP’s”) for:

- an expert in energy efficiency evaluation to provide on-call evaluation planning, design, and management assistance;
- technical and management assistance in verifying Efficiency Vermont’s annual savings and total resource benefit claims and related activities;
- a scoping study to refine the evaluation objectives and provide draft RFP’s for services to achieve those objectives.
- residential sector evaluation studies; and
- business sector evaluation studies.

Dr. Martin Kushler, a nationally recognized energy efficiency evaluation expert, was retained to provide evaluation planning, design, and management services on call. West Hill Energy & Computing provides the needed expertise for the DPS’s verification activities. A team of highly qualified national evaluation professionals, led by Nick Hall of TecMarket Works, completed the scoping study that resulted in the RFP’s for the two major studies completed in this cycle. KEMA, Inc. conducted the residential sector evaluation studies and RLW Analytics was the successful bidder to conduct the business sector evaluation studies. The Department also participated with other New England utilities in a residential lighting impact study completed in October 2004. The results of this work are summarized in this report and the Executive Summaries are attached as Appendices.

The Department utilized Energy Efficiency Division staff to plan for and manage the implementation of the contracted evaluation activities described in the balance of this report.

Staff also served on the Advisory Committee for a NEEP report, “The Need for and Approaches to Developing Common Protocols to Measure, Verify and Report Energy Efficiency Savings in the Northeast” completed January 2006 and made a presentation on a panel at the August 2005 International Association of Energy Evaluators conference.

DPS Verification of EVT Annual Savings and Total Resource Benefit (“TRB”) claims

EVT’s contract with the Public Service Board provides for the DPS to annually review and verify Efficiency Vermont’s annualized MWh and total resource benefits (“TRB”) claimed in its Annual Report. After a two to three month process of in-depth review and investigation, the DPS issues a report and recommendation to the EEU Contract Administrator. The Contract Administrator subsequently makes a recommendation to the Board regarding the appropriate savings EVT may claim for the reporting year. The DPS completed verification reviews for EVT’s 2002, 2003, and 2004 reported savings with EEC funds budgeted for the three year contract cycle for this report. The 2005 verification process and determination of certain other contract performance indicators for EVT’s 2003-2005 contract will be completed by mid-June, 2006.

West Hill Energy & Computing provided services to the DPS in 2003 for the 2002 verification process under an existing contract. The Department issued an RFP on February 17, 2004 for the review and assessment of reported energy savings, total resource benefits and certain program performance indicators related to EVT’s program delivery services for another three years. Five proposals were received. The Department decided to continue contracting with West Hill for these services.

For Year 2002, the DPS recommended reductions of about 3% in EVT’s claimed annualized MWh savings and TRB. The 2002 review also verified that EVT met its performance indicator related to the average participant kWh savings obtained in its Low Income Single Family Program in 2002. The Contract Administrator notified the Board in a letter dated July 7, 2003 of his concurrence with the DPS’ 202 recommendation. The Public Service Board subsequently certified these performance results and authorized VEIC performance incentives for the 2000 - 2002 contract cycle..²

Calendar year 2003 was the first year of EVT’s second, 3-year contract period. The performance indicators in this contract include goals for annualized MWh savings, summer coincident peak savings, and total resource benefits. As a result of the DPS verification

² Year 2002 was the third year of EVT’s initial 3-year contract. The Efficiency Vermont contractor, Vermont Energy Investment Corp. (“VEIC”) met all its contract performance goals for the 2000-2002 period.

process for EVT's 2003 claimed savings and TRB, EVT reduced its claimed annual MWh savings by 6.3%, its summer coincident peak demand savings by 12.3%, and its TRB by 18.1%.

The DPS process of verifying EVT's 2004 claimed savings and TRB included the development, testing, and modification of a random stratified sampling technique used to review commercial and industrial projects. In the past, projects were chosen for review based on a somewhat subjective assessment of where there might be issues of concern. Most adjustments were made only to those projects or measures reviewed. With the 2004 verification process, projects for review were chosen based on a stratified random sample and the review adjustments were applied to all project savings. Developing and implementing this methodology required additional time and resources in 2005 to complete the process, but the result is increased confidence in the outcome of the verification process.

As a result of the Department's verification, Efficiency Vermont's annualized MWh savings claims were reduced by 11.3%; TRB by 7.3%, and summer coincident peak demand by 13.9%. Details of the final adjustments can be found in a September 20, 2005 letter and attachment to Ann Bishop of the PSB from Michael Wickenden, the EEU Contract Administrator. A discussion of the sampling methods and results can be found in the "Report to the Energy Efficiency Utility Contract Administrator Verification for Efficiency Vermont Year 2004 Savings and total Resource Benefit (TRB) Claim" dated July 8, 2005.

The annual verification reports and recommendations are identified in the document list at the end of this report and are available on the Department's website or upon request. A summary of DPS verification based revisions to claimed EVT savings and TRB is shown in the following table.

Table 2: Summary of Verification Process Results³

Year	EVT Preliminary Report			Board verified EVT results		
	Annualized MWh	TRB	Summer coincident Peak KW	Annualized MWh Revised	TRB Revised	Summer Coincident Peak KW
2002	39,560	\$25,938,348	NA	38,369	\$25,132,962	NA
2003	49,815	\$51,290,394	6,839	46,675	\$41,987,043	5,998

³ The Verification adjustments do not include savings and TRB for the Customer Credit Program, since they are not included in EVT's contract targets.

2004	57,409	\$37,743,745	8,650	50,915	\$34,996,219	7,447
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Over the three year period, the DPS reviewed EVT's Technical Reference Manual ("TRM") and numerous revisions to the TRM and participated in periodic technical advisory group meetings with EVT, BED, and the Contract Administrator.

The Public Service Board's independent audit of EVT's reported energy and capacity savings completed in late December, 2005 found that "The EVT estimates of Annual Energy and Capacity Savings, as verified and adjusted by the Department of Public Service, are reliable and unbiased estimates of program savings."⁴

Scoping Study

The Department's EEU Evaluation Plan for this contract period included a scoping study to assist the Department in refining the market sector evaluation objectives and prepare RFP's to acquire the needed evaluation services. On March 17, 2004, the Department issued an RFP for an evaluation scoping study and in early May, the DPS contracted with a team led by Nick Hall of TecMarket Works that also included Sharon Barata of B&B Resources and Ken Keating and Associates. This step in the Plan implementation was very efficient and productive. The contractors delivered two draft RFP's prior to July 1, 2004 that, with minor revisions, were used to solicit proposals for the balance of the Department's identified evaluation goals.

Residential Market Sector Evaluation

In July, 2004, the Department issued an RFP for evaluation research for Efficiency Vermont's residential sector initiative. The RFP listed six tasks in its statement of work

1. Residential Lighting Study
2. Refrigerator Life Expectancy study
3. Appliance Saturation Survey
4. Appliance Sales Data Survey
5. Update Residential New Construction Baselines
6. Strategic Process Evaluation

Proposals were received August 25, 2004 from three energy evaluation consulting firms. Following the DPS initial review, the three candidates were asked to elaborate on the

⁴ "Independent Audit of Vermont Energy Efficiency Utility Energy and Capacity Savings for 2002 Through 2004", Martin Cummings, December 23, 2005, p. 3.

potential methods available to obtain and use actual, comparative retail sales data to help estimate market activity and EEU net market effects. In mid-September, KEMA, Inc. was retained to provide this research. A kick-off meeting was held November 18, 2004 and the research conducted primarily in the first six months of 2005. Preliminary results were presented to the DPS, PSB, and other stakeholders on July 20, 2005. The final report was delivered December 2005.

This research provides valuable information on the current market effects of EVT's services and initiatives and potential areas where additional services may be provided. Of particular interest in this research was the use of retailer sales data to provide information on the market activity for compact fluorescent lamps ("cfl's"), which demonstrated significant impacts from the EVT programs on the residential lighting market.. The key findings and recommendations are summarized in the Executive Summary of the "Final Report: Phase 2: Evaluation of the Efficiency Vermont Residential Programs", attached as Appendix 1. The complete report and appendices can be found at <http://publicservice.vermont.gov/pub/other-pubs.html>

The Department also participated with some New England utilities to study the impact of the 2003 Residential Lighting Programs. This study included the use of lighting loggers in Vermont participant homes, as well as participant surveys. The results were used to modify the assumptions used by Efficiency Vermont and Burlington Electric Department to claim savings from the lighting rebates in the Efficient Products (now called Retail products) initiative. The complete report can be found at <http://publicservice.vermont.gov/pub/other-pubs.html>

Commercial and Industrial Markets Summary

In July, 2004, the Department issued an RFP for evaluation research for Efficiency Vermont's business sector initiative. The RFP requested research that would update equipment and new construction baseline practices and assess the market impacts of EVT's services in its targeted markets. The RFP listed 9 major tasks the DPS was interested in pursuing, grouped into three priority categories, and invited respondents to propose research to accomplish most, or even all, of the 9 tasks.

As with the residential sector RFP, proposals were received August 25, 2004 from three energy evaluation consulting firms. In mid-September, RLW Analytics was chosen to undertake the evaluation research in their proposal. The Project Manager for the KEMA residential studies was a partner with RLW Analytics in their proposal, thereby satisfying the Department's desire that the evaluation research be coordinated between the residential and business sector markets to the greatest extent possible. It is well understood that there is a great deal of overlap among residential and business market trade allies in Vermont, thus the evaluation surveys were coordinated and integrated wherever possible and appropriate.

A project kick-off meeting was held November 19, 2004 and the research was conducted primarily in the first six months of 2005. Preliminary results were presented to the DPS, PSB and other stakeholders on August 30, 2005. A final report was provided to the Department in February 2006.

The results show that the Efficiency Vermont business programs model is sound and that EVT has done a good job executing the model. The research indicates EVT's influence on the energy efficiency markets has increased over time and there is some evidence that suggests the programs are influencing additional market decisions not directly tied to program participant activity. The key findings and recommendations are summarized in the Executive Summary of the "Final Report: Phase 2 Evaluation of the Efficiency Vermont Business Programs", attached as Appendix 2. The complete report and appendices can be found at <http://publicservice.vermont.gov/pub/other-pubs.html>

Burlington Electric Department ("BED")

The Burlington Electric Department implements the energy efficiency utility services and initiatives in its service territory. The evaluation studies conducted for the DPS by KEMA and RLW Analytics in 2005 were statewide in scope and thus included BED customers and market actors.

The Department did not conduct a separate third-party evaluation of BED's implementation during this period. However, BED's annual energy efficiency reports show that it has continued to provide the "EEU" services and initiatives to its customers very successfully and at a cost per saved MWh that is lower than Efficiency Vermont's costs. BED's implementation is not increasing the administrative costs of delivering the statewide EEU programs. The Department fully supports the continuation of BED delivery of EEU services in its service territory.

V. List of Appendices and Supporting Documents

List of Appendices

- Appendix 1: "Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs" Executive Summary, KEMA, Inc., December 2005
- Appendix 2: "Final Report: Phase 2 Evaluation of the Efficiency Vermont Business Programs" Executive Summary, RLW Analytics and KEMA, Inc., February 2006
- Appendix 3: "The Department of Public Service's Energy Efficiency Utility Evaluation Plan For The Contract Period 2003 through 2005", DPS, December 1, 2003
- Appendix 4: "Revised List of Evaluation Projects For the Contract Period 2003 through 2005", DPS, March 2004

List of Project Documents

The following documents are available on request from the Vermont Department of Public Service. They will also be posted on the Department's web site at:

<http://www.state.vt.us/psd/ee/ee.htm>

1. Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs, KEMA, Inc., December 2005
2. Final Report: Phase 2 Evaluation of the Efficiency Vermont Business Programs, RLW Analytics and KEMA, Inc., February 2006
3. Impact Evaluation of the Massachusetts, Rhode Island, and Vermont 2003 Residential Lighting Programs., Nexus Market Research Inc. and RLW Analytics, Inc., October 1, 2004
4. Report to the Energy Efficiency Utility Contract Administrator Verification for Efficiency Vermont Year 2004 Savings and Total Resource Benefit (TRB) Claim", Department of Public Service, July 8, 2005.
5. Report to the Energy Efficiency Utility Contract Administrator Verification for Efficiency Vermont Year 2003 Savings and Total Resource Benefit (TRB) Claim", Department of Public Service, July 13, 2004

6. Report to the Energy Efficiency Utility Contract Administrator Verification for Efficiency Vermont Year 2002 Savings and Total Resource Benefit (TRB) Claim”, Department of Public Service, June 16, 2003
7. “Independent Audit of Vermont Energy Efficiency Utility Energy and Capacity Savings for 2002 Through 2004”, Martin Cummings, December 23, 2005
8. NEEP “Scoping Study on Market Penetration Tracking of Energy-Efficient Motors and Packaged HVAC Systems in New England and New York”, Nexus Market Research, Inc., August 8, 2003
9. NEEP “The Need for and Approaches to Developing Common Protocols to Measure, Verify and Report Energy Efficiency Savings in the Northeast Final Report”, January 2006